NARSIMHA REDDY ENGINEERING COLLEGE
UGC AUTONOMOUS INSTITUTION
Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India
UGC - Autonomous Institute
Accredited by NBA & NAAC with 'A' Grade
Approved by AICTE
Permanently affiliated to JNTUH

UNIT I: Introduction, Power Unit, Fuel System (SI & CI Engines)

Multiple Choice Questions (MCQs)

1. Which component of an automobile forms the structural base that carries the engine, transmission, and body?

    a) Chassis

    b) Bonnet

    c) Fender

    d) Firewall

2. In a front-engine, rear-wheel-drive layout, which component connects the transmission output shaft to the differential input?

    a) Axle shaft

    b) Propeller shaft

    c) Clutch shaft

    d) Tie rod

3. An engine that uses a single housing with a triangular rotor spinning inside an oval chamber is known as a:

    a) Radial engine

    b) Opposed cylinder engine

    c) Wankel rotary engine

    d) Inline engine

4. What is the primary function of the engine lubrication system?

    a) To provide fuel-air mixing

b) To minimize friction and wear between moving parts

c) To advance spark ignition timing

d) To increase exhaust gas velocity

5. During engine servicing, measuring cylinder bore wear (taper and out-of-roundness) is typically done using a:

a) Feeler gauge

b) Dial bore gauge

c) Thread pitch gauge

d) Vernier height gauge

6. Which type of fuel pump in an SI engine operates using an eccentric cam on the engine camshaft pushing a diaphragm rocker arm?

a) Electric roller pump

b) Mechanical fuel pump

c) In-tank turbine pump

d) High-pressure plunger pump

7. The process of mixing fuel with air in the correct proportion outside the cylinder in an older SI engine is called:

a) Atomization

b) Scavenging

c) Carburetion

d) Detergency

8. In a simple carburetor, which circuit supplies fuel when the throttle valve is completely or nearly closed?

a) Main metering system

b) Idle and low-speed system

c) Choke system

d) Acceleration pump system

9. What does the acronym MPFI stand for in modern spark-ignition systems?

    a) Multi-Point Fuel Injection

    b) Mechanical Port Fuel Induction

    c) Main Pressure Fuel Injector

    d) Multi-Phase Fuel Ignition

10. Which system injects gasoline directly into the combustion chamber at very high pressures rather than into the intake port?

    a) MPFI

    b) Carburetor

    c) GDI (Gasoline Direct Injection)

    d) Thermosyphon

11. Why do Compression Ignition (CI) engines require much higher fuel injection pressures than conventional SI port injection engines?

    a) To match the lower air pressure in the cylinder

    b) To overcome high cylinder compression and achieve fine atomization in dense air

    c) To prevent the spark plug from fouling

    d) To slow down the rate of combustion

12. In which type of CI engine combustion chamber is fuel injected directly into a single open space above the piston?

    a) Indirect Injection (IDI) system

    b) Pre-combustion chamber system

    c) Direct Injection (DI) system

    d) Air cell system

13. The structural part of a fuel injector that directly dictates the spray pattern and droplets size is the:

    a) Plunger

    b) Delivery valve

c) Nozzle

d) Governor

14. What occurs during the "physical delay" period of diesel fuel spray formation?

a) Chemical oxidation reactions begin

b) Atomization, vaporization, and mixing of fuel with air

c) The mechanical opening of the contact breaker points

d) The closing of the intake valve

15. A diesel fuel injection pump calibration and testing bench primarily measures:

a) The spark plug voltage output

b) The uniformity and volume of fuel delivered by each pump cylinder element

c) Exhaust gas temperature

d) Oil viscosity variations

16. CRDI systems maintain a continuous high pressure inside an accumulator line. CRDI stands for:

a) Continuous Rail Diesel Injection

b) Common Rail Diesel Injection

c) Compressor Rotating Diesel Injector

d) Cylinder Regulated Direct Injection

17. TDI systems combine direct injection with which component to boost volumetric efficiency?

a) Carburetor

b) Turbocharger

c) Mechanical Governor

d) Radiator Fan

18. Which engine oil additive helps prevent soot and oxidation products from clumping together and forming sludge?

a) Viscosity Index Improver

b) Pour point depressant

c) Detergent/Dispersant

d) Anti-foam agent

19. A dry-type paper element air filter is cleaned during routing servicing by:

    a) Washing it thoroughly in diesel fuel

    b) Blowing low-pressure compressed air from the inside out

    c) Coating it with heavy gear oil

    d) Heating it in an oven

20. The component in a mechanical diesel fuel pump that regulates maximum engine speed and prevents engine runaway is the:

    a) Distributor

    b) Governor

    c) Accumulator

    d) Solenoid valve

Fill in the Blanks

1. The sheet metal shell or carbon-fiber outer structure that encloses the mechanical aggregates and provides passenger space is called the _____
2. Engines with cylinders arranged in two banks at an angle between $60^\\circ$ and $90^\\circ$ form a_____ configuration.
3. The type of lubrication system that stores oil in a separate external reservoir tank instead of the oil pan is called a_____ lubrication system.
4. An engine servicing procedure where a tool with abrasive stones expands inside the cylinder block to restore its finish and cross-hatch pattern is called_____
5. The ratio of air to fuel by weight that represents chemically perfect combustion is known as the _____ ratio.
6. The narrowest portion of a carburetor tube that accelerates air velocity and creates a localized pressure drop is called the _____
7. To facilitate cold starting, a carburetor uses a _____ valve to temporarily restrict airflow and enrich the fuel mixture.
8. In a_____ MPFI system, fuel pressure is regulated inside the fuel tank, eliminating the line returning from the engine fuel rail.
9. An IDI engine utilizes a small secondary chamber called a_____ or swirl chamber to initiate combustion.
10. The phenomenon where a fuel jet breaks up into a mist of tiny droplets immediately after leaving the nozzle orifice is called _____.

11. _____refers to the exact angular position of the crankshaft (in degrees BTDC) at which the fuel injection pump begins delivering fuel to the cylinder.
12. The valve located at the exit of an inline fuel injection pump element that maintains a residual line pressure to prevent cavitation is called the _____
13. In a CRDI system, the fuel pressure inside the rail is dynamically regulated via a _____or metering unit.
14. The main structural element of the chassis that absorbs longitudinal bending and twisting forces is the _____.
15. An engine layout where the engine, transmission, and differential are all built into a single unit driving the front wheels is referred to as a_____ layout.
16. The clearance between a valve stem tip and its rocker arm or camshaft lobe is checked using a _____ during servicing.
17. In an electrical fuel pump, a_____ opens if the downstream lines become restricted to protect the pump motor from burning out.
18. The component that monitors the volume or mass of air entering an electronically controlled injected engine is the _____ sensor.
19. The spray angle and penetration length of diesel fuel are highly dependent on the geometry of the _____
20. The component that traps microscopic metal shards and abrasive particulates from the oil stream before it enters the main engine bearings is the _____